ANESTHESIOLOGY NEWS

Technology

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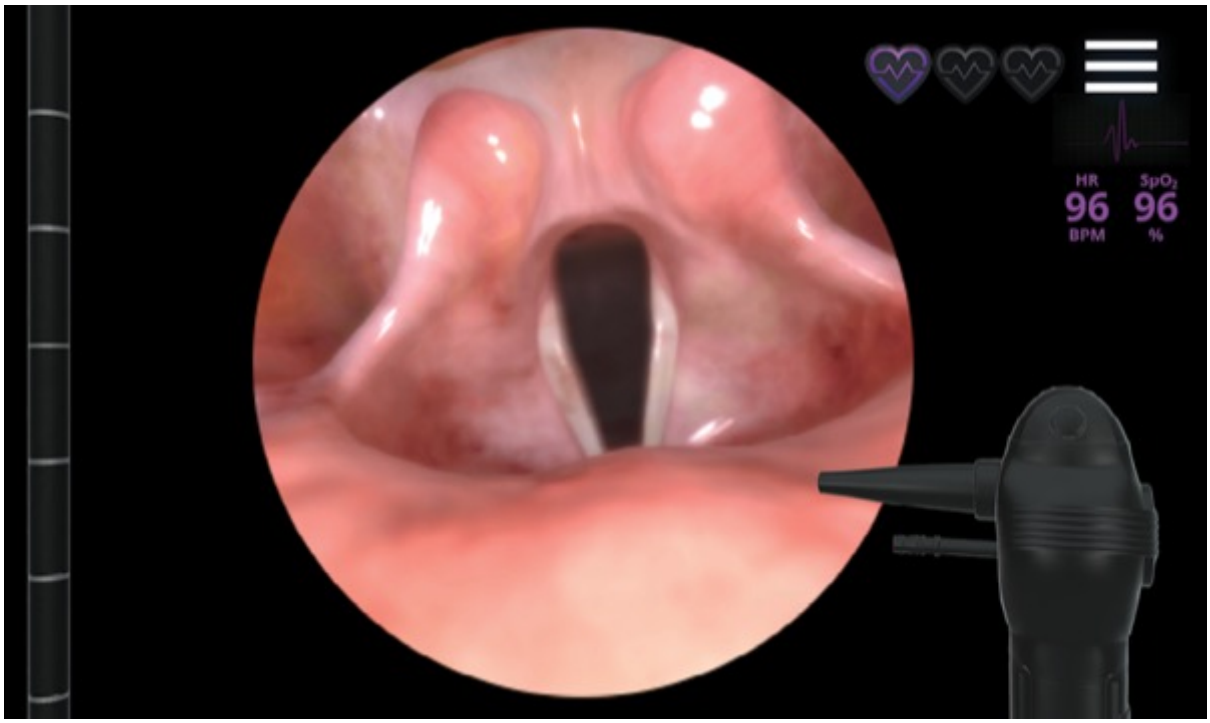
Medical Simulation App Facilitates Intubation Training



Chicago—A free gaming application downloaded to mobile devices allows anesthesiologists to try their skills at a variety of airway procedures, without needing hardware.

Airway EX from Level EX Inc, is a comprehensive, interactive, virtual patient airway simulator of rare and/or difficult cases such as fiberoptic laryngoscopy, a burned airway (featuring a firefighter) and selected tumors.

“Because our product is available on any iOS or Android smartphone and tablet, every few weeks we are releasing new cases and new content to the audience,” said Sam Glassenberg, company founder and CEO. These anesthesia procedures are also relevant to emergency medicine because they secure the airway.

Airway EX was launched last October. By December, the company had released roughly 20 simulated patient cases, all developed by a team of game and simulation experts. “We have also been working very closely with anesthesiologists from all over the country to collect and accurately simulate the most difficult airway scenarios that they have encountered,” Mr. Glassenberg said.


Sam Glassenberg

Numerous cases also provide continuing medical education (CME) credit for users who achieve a high score. “Level EX is the only mobile app in the world that enables someone to earn CME credit by performing these virtual surgery and virtual anesthesia procedures,” Mr. Glassenberg said.

The product is entirely interactive, including the physiology (Figure). “The simulation looks completely realistic—there is bleeding, swelling, saliva and secretions on your scope,” Mr. Glassenberg said.

The 3-D app simulates the mechanisms of the scope the way a lens works, “including how the light bounces around inside the patient’s airway,” Mr. Glassenberg said. Furthermore, the app mimics the patient’s vital signs. The user also can trigger a laryngospasm-related cough.

For fiber-optic laryngoscopy, the user chooses from a variety of scopes. Then, if the user hits a particular anatomy with the scope, the anatomy can bleed or swell. “You have full control, just like you do when holding a laryngoscope,” Mr. Glassenberg said. “The user can also stop motion as much as he can in real life.”


Adrian Pichurko, MD

Depending on the complexity of the scenario, it takes a user only a few minutes on average to complete a case.

Adrian Pichurko, MD, assistant professor of anesthesiology at Northwestern University Feinberg School of Medicine, in Chicago, has been using Airway EX for several months. “This is the most realistic trainer for fiber optics I have ever seen,” he said. “I also like that it is accessible and can be used in almost any setting.”

Airway EX is designed like a game, with minimal instructions provided. “It is set up in a way that you sort of figure out how it works on your own,” Dr. Pichurko said. “It is also fun. You accumulate points during each scenario, so there are rewards as you go along. As you move on to the next level of a case, you unlock further scenarios, for a sense of accomplishment.”

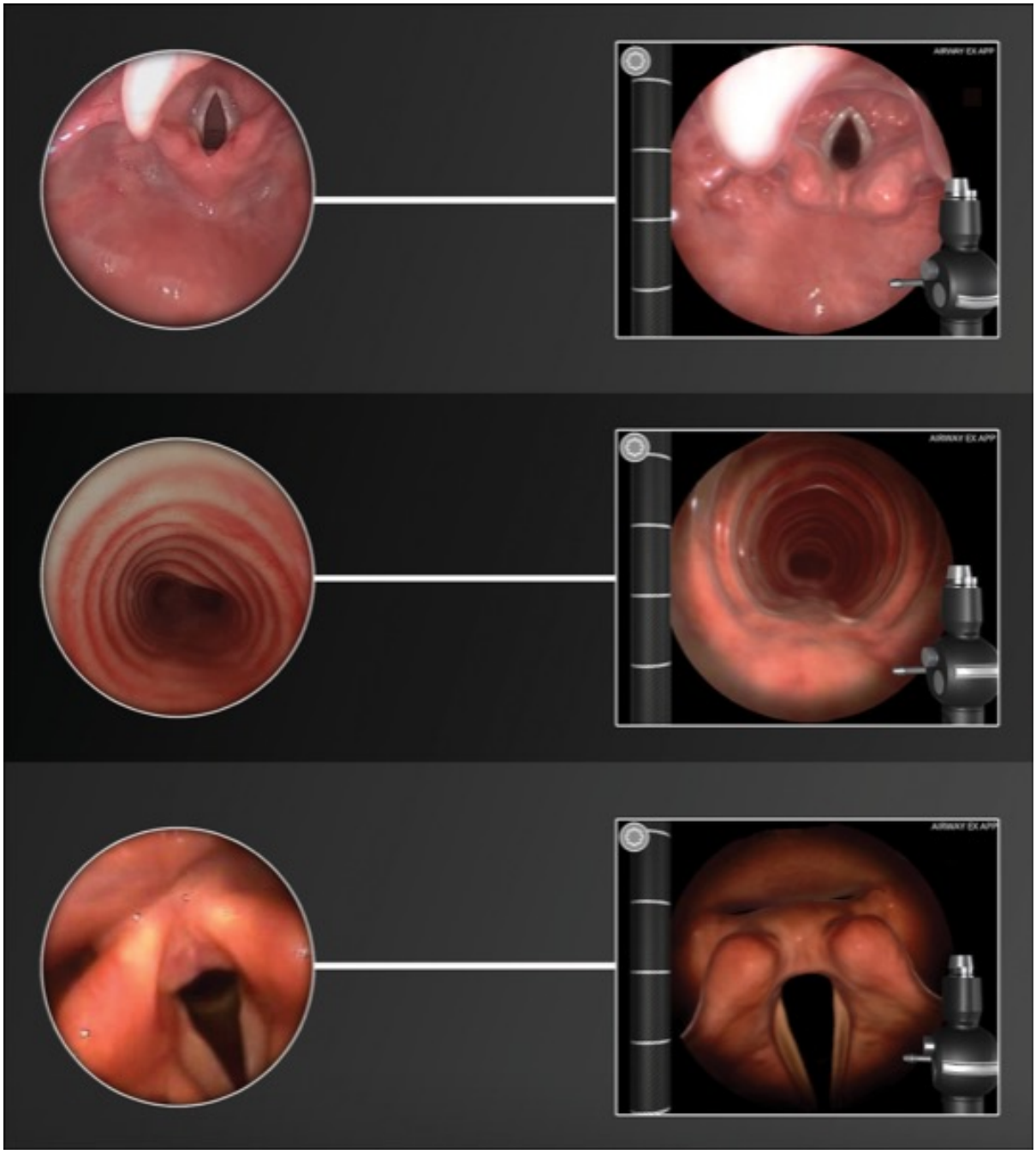


Figure. Comparison of photos from a real patient (left) and the Airway EX app (right).

Dr. Pichurko said that for fiber-optic bronchoscopy, the controls are inverted to the direction the scope is to be inserted. “This requires sort of a backwards thinking, similar to the way some video game controls operate,” he said. “Therefore, practicing with that mentality and with manual dexterity is invaluable.”

A particularly fun and beneficial virtual scenario is a glottic tumor that obstructs the airway. “It makes you think a little bit differently as to how you would navigate through different crests and crevices in relation to hitting your target,” Dr. Pichurko said.

He also cited a nasal intubation scenario, “where the anatomy is slightly different and the trajectory in which you approach the airway is different as well.”

Besides the airway scenarios, there are a handful of diagnostic endoscopy cases, for which the user attempts to identify certain important anatomic landmarks and diagnose a condition based on the situation presented.

Dr. Pichurko said simulation training is invaluable because it allows an anesthesiologist to practice scenarios on different types of anatomy that are most fundamental "to our profession, which is saving someone's life. However, because these cases are so infrequent, you tend to get rusty at them. But our most important skills are those that we get to practice the least."

Mr. Glassenberg said Airway EX has been downloaded thousands of times, and at the 2016 annual meeting of the American Society of Anesthesiologists, the company's booth was popular.

To access the product, a person simply goes to the app store on their mobile device, searches for "Airway EX" and downloads it for free.

"The realism and visual quality is better than what you would find in a simulation center that costs hundreds of thousands of dollars," Mr. Glassenberg claimed. "More important, though, is that Airway EX runs on the device you already have, instead of having to travel to a simulation center, which is inaccessible to many physicians outside of academic centers."

There are no other companies offering a similar product, according to Mr. Glassenberg, who founded Level EX in 2015. "Although there are many companies that offer surgical simulation or even anesthesia simulation, none provide high-fidelity simulation via mobile devices," he said.

Level EX makes money by partnering with medical device and pharmaceutical companies that want to visually demonstrate the benefits of their products in the app. "We find that physicians want to be able to try the latest devices on a virtual patient, without having to try the device on a live patient or travel to a cadaver lab," Mr. Glassenberg said.

In addition, the company has separate modules certified for CME that are available for purchase.

Currently, Airway EX is limited to virtual generic devices in its case studies, but soon there should be specific devices identified by manufacturers, which will provide the company additional revenue.

—Bob Kronemyer

Dr. Pichurko reported no relevant financial disclosures.